

NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

Astronaut Rescue Air Pack (ARAP) and Emergency Egress Air Pack (EEAP)

Two designs for a lightweight low-profile, mobile rescue apparatus provide a 15-minute air supply and a self-contained, two-way communications assembly. The principle difference between the two units is that the ARAP is donned in advance of entry into a hazardous environment to perform an assigned task, while the EEAP is designed to be donned quickly by persons performing work in a normal environment which suddenly becomes hazardous.

The first unit consists of a face mask with a headset, a microphone, and electrical cable; three gas-flow regulators, two primary and one secondary; two air cylinders; a harness-and-hose assembly, to support one cylinder on each hip and a radio transceiver on a back strap, and a supplementary air supply, provided by 12 auxiliary cylinders paired on six manifolds.

Substitution of the second unit for the first one is dictated by the situation. The second unit consists of the same face mask with communications equipment and cable; one primary and one secondary gas-flow regulator; and a two-cylinder manifold air supply with harness-and-hose assembly for secure mounting of the air supply and radio.

Air is supplied to either rescue unit by opening a valve on the 9.9 standard cu. ft. cylinders, supplying pressure to the primary regulator. The 2550 psig cylinder pressure is reduced to 140 ± 14 psig and connected to the secondary regulator,

from which 2.8 standard cu. ft. per minute of air for breathing is supplied to the positive-seal face mask at null pressure (0.0 in. of water). To exclude toxic vapors, the face mask employs an exhalation valve, with a cracking pressure of 2.3 ± 0.3 in. of water, to retain a positive gage pressure at all times. A low-profile alarm whistle warns the operator when the pressure in the cylinders reaches 450 ± 25 psig. Also, each cylinder is equipped with a low-profile stem-gage pressure indicator.

Notes:

1. These air packs, originally designed for the Apollo program, may be of interest to fire fighters, mine disaster units, and rescue squads.
2. No additional documentation is available. Specific questions, however, may be directed to:
Technology Utilization Officer
Mail Code AD-TU
Kennedy Space Center
Kennedy Space Center, Florida 32899
Reference: B70-10680

Patent status:

No patent action is contemplated by NASA.

Source: W.L. Barnhart and R.D. Clew of
Bendix Corporation and
H.M. Waddell, Jr., of
North American Rockwell Corp.
under contract to
Kennedy Space Center
(KSC-10522)

Category 03